

CLAIM CHART**Claim # of U.S. Ser. No.**
10/587,548

Claim 1: A transfer display film comprised of stacked layers that are prepared on, cured or dried and lifted from a release surface and then transferred to a substrate,...

...wherein said stacked layers comprise at least one liquid crystal dispersion layer comprising liquid crystal material dispersed in polymer,...

...a first electrically conductive layer located near one side of said dispersion layer, an electrical insulation layer located between and in contact with said first conductive layer and said dispersion layer, a second electrically conductive layer located near the other side of said dispersion layer, and an electrical insulation layer located between and in

Support in U.S. Ser. No.
60/598,163

The '163 application discloses a display that is a film and includes stacked layers. The layers are cast on a release liner, cured or dried and then transferred to a substrate. Para. bridging pp. 1 and 2, Example 3.

The '163 application discloses that the display includes liquid crystal dispersions. P. 2, 3d para. This can be liquid crystal material dispersed in polymer binder. Example 1, 1st para.

The '163 application discloses that the display film includes the coated or printed sequence including a lower conducting electrode, a liquid crystal dispersion layer and an upper conducting electrode. Claims 1-3. Figure 1 shows a lower conducting electrode layer 103 near one side of the liquid crystal layer 10, an electrical insulation layer 104 between and in contact

contact with said dispersion layer and said second conductive layer.

with the electrode layer 103 and liquid crystal layer 105, an upper conducting layer 107 near the other side of the liquid crystal layer and an electrical insulation layer 106 between and in contact with the upper conducting layer 107 and the liquid crystal layer 105. See also page 4.

Claim 2: A transfer display film according to claim 1 comprising a casting layer applied on or near the release surface on which other said layers of the display are prepared.

The '163 application discloses a casting layer as the next layer in sequence relative to a release liner and other layers located on the casting layer. Claim 2. An adhesive layer can be located between the casting layer and the release liner. Claim 10. See also Fig. 2 which depicts the other layers of the display stacked on the casting layer applied on the release liner.

Claim 3: A transfer display film according to claim 1 wherein said plurality of stacked layers are stacked in a sequence comprising a casting layer, said first said electrically conductive

See the discussion of claims 1 and 2 above. Fig. 1 and page 4 describe a casting layer, first conductive layer, dispersion layer and second conductive layer.

layer, said dispersion layer,
and said second said
electrically conductive
layer.

Claim 4: A transfer display
film according to claim 3
wherein at least one of said
first and second electrically
conducting layers comprises a
transparent electrical
conductor formed of a
conducting polymer or carbon
nanotube material.

Claim 9: A transfer display
film according to claim 3
wherein said dispersion layer
comprises at least one of an
emulsion, phase separation
and microencapsulated liquid
crystal material.

Claim 10: A transfer display
film according to claim 1
wherein said liquid crystal
comprises bistable
cholesteric liquid crystal.

The '163 application
discloses that the conducting
electrodes can be a
transparent conductor made of
conducting polymer or carbon
nanotube material. Claim 4.

The '163 application
discloses that the dispersion
layer can be made from an
emulsion, phase separation or
microencapsulation process.
Page 4, item 5.

The '163 application
discloses that the liquid
crystal is bistable
cholesteric liquid crystal.
P. 2, 3d full para.

Claim 13: A transfer display film according to claim 3 comprising a light absorbing layer located between said casting layer and said dispersion layer.

The '163 application discloses a light absorbing layer between the casting layer and the dispersion layer. P. 4, items 1-5, and Fig. 1.

Claim 15: A transfer display film according to claim 3 comprising a clear protective layer located over the second electrically conducting layer to ruggedize said transfer display film.

The '163 application discloses a clear protective layer 108 disposed above the upper electrode to ruggedize the display. Page 5 item 8 and Fig. 1.

Claim 16: A liquid crystal display comprising the transfer display film according to claim 15 further comprising said substrate attached to the transfer display film near said casting layer.

The '163 application discloses laminating the transfer film onto a substrate attached to the film near the casting layer. Page 5, 1st full para and Fig. 2.

Claim 18: A transfer display film according to claim 1 comprising an outer adhesive layer.

Claim 19: A transfer display film according to claim 1 wherein the at least one said dispersion layer comprises at least one bistable cholesteric liquid crystal reflective of visible or infrared electromagnetic radiation.

Claim 21: A transfer display film according to claim 19 comprising a transparent electrically conductive layer located between adjacent said dispersion layers.

Claim 22: A transfer display film according to claim 1 wherein said dispersion layer comprises left and right hand twist cholesteric

The '163 application discloses an outer adhesive layer on which the casting layer is coated, printed or laminated that lifts off the release liner with the casting layer. Claim 10. See also Example 3.

The '163 application discloses that the display can reflect visible (red, green and blue, RGB colors) or infrared electromagnetic radiation. P. 5, last para.; P. 6, 1st full para.

The '163 application discloses stacked sublayers of liquid crystal dispersions each separated with a transparent conducting electrode. Claim 14.

The '163 application discloses that the dispersion layer is made up of left and right hand twist cholesteric materials, separated to prevent mixing. Claim 17.

materials, separated to prevent mixing.

Claim 23: A transfer display film according to claim 22 wherein said dispersion layer comprises one sublayer including said left hand twist cholesteric material and another sublayer comprising said right hand twist cholesteric material.

Claim 24: A transfer display film according to claim 19 wherein the at least one said dispersion layer comprises one said dispersion layer reflective of red light, another said dispersion layer reflective of blue light and another said dispersion layer reflective of green light and electrically conductive layers are disposed between said dispersion layers.

Claim 25: A transfer display film according to claim 1 wherein said dispersion layer is patterned with red, green and blue pixels.

The '163 application states that the dispersion layer is a double coating of one left hand twist cholesteric material and one right hand twist cholesteric liquid crystal material. Claims 17 and 18 and p. 5. 4th full para.

The '163 application discloses stacked sublayers of cholesteric liquid crystal dispersions reflective of red, green and blue light and each separated with a transparent conducting electrode. Claims 14 and 15.

The '163 application discloses a single dispersion layer patterned with red, green and blue pixels. P. 5, 5th full para.

Claim 26: A liquid crystal display device comprising the transfer display film and said substrate of claim 1 and driving circuitry connected to said first and second electrically conductive layers.

Claim 27: A liquid crystal display device according to claim 26 wherein said substrate is a solar panel effective to provide a self-powering display.

Claim 28: A liquid crystal display device according to claim 26 wherein said substrate comprises a photoconductive sheet and said first electrically conductive layer adapted to enable said liquid crystal layer to be driven by impinging light onto said display film while applying voltage to said second electrically conductive layer and said first electrically conductive layer.

The '163 application discloses transfer of the film to a substrate and connecting the electrodes to driving circuitry. P. 2, 4th full para.

The '163 application discloses that the display film can be laminated onto a solar panel for conversion of light into electrical power for powering the display. P. 6, 2d full para.

The '163 application discloses transferring the display film to a photoconductive sheet with an electrode underneath and then driving the film by impinging light onto the display film while applying voltage to the electrodes. P. 6, 3d full para.

Claim 29: A liquid crystal display device according to claim 26 wherein said substrate comprises an active matrix device.

Claim 33: A liquid crystal display device according to claim 26, wherein one of said first electrically conductive layer and said second electrically conductive layer contains parallel strips of row conductors and the other of said first electrically conductive layer and said second electrically conductive layer contains parallel strips of column conductors.

Claim 36: A transfer display film according to claim 26 comprising an outer layer of adhesive.

The '163 application discloses lamination of the display film onto an active matrix substrate. P. 2, 2d full para.

The '163 application discloses parallel strips of row and column electrodes of a passive matrix. See second complete para. of page 2 and Example 1.

The '163 application discloses that the casting layer includes an adhesive which along with the other layers are formed on a release liner. This was transferred onto a substrate and driven upon application of voltage. Example 3.

Claim 43: A lift-off display film comprising stacked layers that are prepared on, cured or dried and then lifted from a release surface,...

wherein said stacked layers comprise at least one liquid crystal dispersion layer comprising liquid crystal material dispersed in polymer,...

... a first electrically conductive layer located near one side of said dispersion layer, an electrical insulation layer disposed between and in contact with said first conductive layer and said dispersion layer, a second electrically conductive layer located near the other side of said dispersion layer and an electrical insulation layer disposed between and in contact with said dispersion layer and said second conductive layer.

The '163 application discloses a display that is a film and includes stacked layers. The layers are cast on a release liner, cured or dried and then lifted from it. Example 3.

The '163 application discloses that the display includes liquid crystal dispersions. P. 2, 3d para. This can be liquid crystal material dispersed in polymer binder. Example 1, 1st para.

The '163 application discloses that the display film includes the coated or printed sequence including a lower conducting electrode, a liquid crystal dispersion layer and an upper conducting electrode. Claims 1-3. Figure 1 shows a lower conducting electrode layer 103 near one side of the liquid crystal layer 10, an electrical insulation layer 104 between and in contact with the electrode layer 103 and liquid crystal layer 105, an upper conducting layer 107 near the other side of the

electrical insulation layer 106 between and in contact with the upper conducting layer 107 and the liquid crystal layer 105. See also page 4.

Claim 46: A lift-off display film according to claim 43 wherein said dispersion layer comprises at least one of an emulsion, phase separation and microencapsulated liquid crystal material.

The '163 application discloses that the dispersion layer can be made from an emulsion, phase separation or microencapsulation process. Page 4, item 5.

Claim 47: A lift-off display film according to claim 43 wherein said liquid crystal comprises bistable cholesteric liquid crystal.

The '163 application discloses that the liquid crystal is bistable cholesteric liquid crystal. P. 2, 3d full para.

Claim 48: A lift-off display film according to claim 43 comprising a clear protective layer located over at least one of said first electrically conductive layer and said second electrically conductive layer that ruggedizes said lift-off display film.

The '163 application discloses a clear protective layer 108 disposed above the upper electrode to ruggedize the display. Page 5 item 8 and Fig. 1.

Claim 51: A lift-off display film according to claim 43 comprising a stack of said dispersion layers each reflective of visible or infrared electromagnetic radiation.

Claim 52: A lift-off display film according to claim 51 further comprising a transparent electrically conductive layer located between adjacent said dispersion layers.

Claim 53: A lift-off display film according to claim 52 wherein said stack of layers comprises one said dispersion layer reflective of red light, another said dispersion layer reflective of blue light and another said dispersion layer reflective of green light.

The '163 application discloses that the display can reflect visible (red, green and blue, RGB colors) or infrared electromagnetic radiation. P. 5, last para.; P. 6, 1st full para.

The '163 application discloses stacked sublayers of liquid crystal dispersions each separated with a transparent conducting electrode. Claim 14.

The '163 application discloses stacked sublayers of cholesteric liquid crystal dispersions reflective of red, green and blue light and each separated with a transparent conducting electrode. Claims 14 and 15.

Claim 54: A lift-off display film according to claim 47 wherein one of said first electrically conductive layer and said second electrically conductive layer comprises parallel row electrode strips and the other of said first electrically conductive layer and said second electrically conductive layer comprises parallel column electrode strips.

Claim 55: A lift-off display film according to claim 43 comprising at least one additional dispersion layer.

Claim 56: A lift-off display film according to claim 55 comprising an electrically conductive layer disposed between dispersion layers.

The '163 application discloses parallel strips of row and column electrodes of a passive matrix. See second complete para. of page 2 and Example 1.

The '163 application discloses using multiple liquid crystal dispersion layers. Page 5, last para.

The '163 application discloses stacked sublayers of liquid crystal dispersions each separated with a conducting electrode. Claim 14.

Claim 57: A transfer display film according to claim 3 comprising a protective layer coated over said second electrically conductive layer as upper electrodes, wherein said protective layer is optically opaque and said layers are transferred to a transparent said substrate with said casting layer nearest to said substrate to operate as a reflective display.

Claim 58: A transfer display film according to claim 1 comprising a preparation layer coated over said second electrically conductive layer as upper electrodes, said preparation layer being an adhesive layer or serving to hold an adhesive overcoat, wherein said display film is transferred to said substrate with said preparation layer adjacent said substrate to operate as a reflective display.

The '163 application discloses the sequence of a casting layer, a lower conducting electrode, the liquid crystal layer and an upper conducting electrode. Claims 1-3. A protective layer is coated over the upper electrode. Claim 8. The protective layer is opaque and the display film is transferred to a transparent substrate with the casting layer nearest to the substrate to operate as a reflective display. claim 12.

The preparation layer is coated over the upper conducting electrodes. The preparation layer is an adhesive layer or serving to hold an adhesive overcoat. The display film is transferred to the substrate with the preparation layer adjacent the substrate to operate as a reflective display. Claims 1 and 13.

Claim 59: A transfer display film according to claim 3 comprising a protective layer coated over said second electrically conductive layer as an upper conducting electrode, wherein said protective layer is optically clear and said film is transferred to said substrate with said casting layer nearest said substrate to operate as a reflective display, comprising an adhesive layer, wherein said casting layer is coated, printed or laminated over said adhesive layer that lifts off said release surface with said casting layer.

The display is made in order of a casting layer, first or lower conducting electrode, liquid crystal layer and second or upper conducting electrode. Claims 1-3. A protective layer is coated over the upper electrodes. Claim 8. The protective layer is clear and the film is transferred to the substrate with the casting layer nearest the substrate to operate as a reflective display. Claim 9. The casting layer is coated, printed or laminated over an adhesive layer that lifts off the release liner with the casting layer. Claim 10.